

**Amendments to the Specification:**

Please amend the title, as it appears on the International Publication Page, as follows:

OPTICAL WAVEGUIDE DEVICE, COHERENT LIGHT SOURCE USING  
THE SAME AND OPTICAL APPARATUS HAVING THE SAME

Please amend the paragraph beginning on page 2, line 17 to read as follows:

For a method of forming a DBR grating on a SHG element, the use of a periodically domain-inverted structure for quasi-phase matching, as a DBR grating, has been proposed. For the periodically domain-inverted structure, a Ti diffusion LiNbO<sub>3</sub> is used. It is known that when LiNbO<sub>3</sub> crystal Ti is thermally diffused thermally into LiNbO<sub>3</sub>, the polarization at the diffusion part will be inverted. Since the refractive index at this diffusion part is increased at the same time, it functions also as a refractive index grating having a periodic change in refractive index. Therefore, the domain-inverted structure can be used for the DBR grating. And the oscillation wavelength of the semiconductor laser can be fixed by harmonizing the DBR reflection wavelength and the phase matching wavelength. Thereby, a wavelength converter with a stable output can be realized. That is, a short wavelength light source having a semiconductor laser and a SHG element integrated with each other will be provided.

Please amend the paragraph beginning on page 6, line 10 to read as follows:

It is also preferable that the nonlinear optical material is a Mg-doped LiNbO<sub>3</sub> crystal, where the phase matching wavelength harmonizes with a Bragg reflection wavelength, and the Bragg reflection wavelength  $\lambda$  satisfies a relationship of  $\lambda_1 < \lambda < \lambda_2$ , and a relationship of  $\lambda_1 = 635 + 48 \times n$  (nm) and  $\lambda_2 = 1.02 \times \lambda_1$  (nm) ( $n = 0, 1, 2$ ), or  $\lambda_1 = 774$  [[nm]] +  $40 \times n$  (nm) and  $\lambda_2 = 1.02 \times \lambda_1$  (nm) ( $n = 0, 1, 2, 3, 4, \dots$ ). As a result, the

Bragg reflection wavelength  $\lambda$  and the phase matching wavelength harmonize with each other, and thus a harmonic can be generated.

Please amend the paragraph beginning on page 6, line 16 to read as follows:

It is also preferable that the nonlinear optical material is a Mg-doped LiNbO<sub>3</sub> crystal, where the phase matching wavelength harmonizes with a Bragg reflection wavelength, and the Bragg reflection wavelength  $\lambda$  satisfies a relationship of  $\lambda_1 < \lambda < \lambda_2$ , and a relationship of  $\lambda_1 = 613 + 48 \times n$  (nm) and  $\lambda_2 = 1.02 \times \lambda_1$  (nm) ( $n = 0, 1, 2$ ), or  $\lambda_1 = 754$  [[nm]] +  $40 \times n$  (nm) and  $\lambda_2 = 1.02 \times \lambda_1$  (nm), ( $n = 0, 1, 2, 3, 4, \dots$ ). As a result, the Bragg reflection wavelength  $\lambda$  and the phase matching wavelength harmonize with each other, and thus a harmonic can be generated.

Please amend the paragraph beginning on page 20, line 7 to read as follows:

Alternatively, the optical waveguide device 108 can be formed so that the convex 106 of the thin film layer 103 is in contact with the LN substrate 102 side, i.e., with the bonding layer 104. A specific example is illustrated in FIG. 4. FIG. 4 is a diagram showing another configuration example of a coherent light source using an optical waveguide device according to the first embodiment. An optical waveguide device 308 is configured by adhering an offcut Mg-doped LiNbO<sub>3</sub> crystal thin film layer 303 on a LN substrate 302 via a bonding layer 304. The thin film layer 303 has a striped convex 306, and a periodically domain-inverted region 305 is formed. The LN substrate 302 and the thin film layer 303 are arranged such that the convex 306 is arranged inside the optical waveguide device 308, facing the LN substrate 302. A coherent light source 300 is made up by the optical waveguide device 308 and a semiconductor laser [[308]] 301 for emitting light to the optical waveguide device 308. The thus configured optical waveguide device 308 can provide a highly-efficient and high-output DBR grating structure for an optical waveguide similar to the optical waveguide device 108 in FIG. 1,

and it can be used for a wavelength converter. Moreover, the coherent light source 300 can emit highly-efficient and stable short wavelength light just like the coherent light source 100 in FIG. 1 does.